What is claimed is:

1. A fuel cell unit comprising;

a plurality of fuel cells, said fuel cells each comprising a plurality of power generation units arranged on a same plane, and electrically connected in series, said power generation units each including an anode, a cathode, and an electrolyte interposed between said anode and said cathode;

a power generation circuit for connecting said fuel cells to a load; and

a switching mechanism for selectively connecting said fuel cells in parallel to said power generation circuit.

2. A fuel cell unit according to claim 1, wherein each of said fuel cells is connected to a variable resistor.

3. A fuel cell unit according to claim 1, wherein said fuel cell further including:

at least one first output terminal connected to one of said anode and said cathode; and

a plurality of second output terminals connected to the other of said anode and said cathode for connecting different numbers of said power generation units in series between said first output terminal and said second output terminals, respectively, wherein

said switching mechanism selectively connects one of

said second output terminals to said first output terminal.

4. A fuel cell unit according to claim 1, said fuel cell further including:

a pair of metal diffusion layers provided on both surfaces of said power generation units; and

a resin insulator provided in said metal diffusion layer, between predetermined power generation units.

5. A fuel cell system comprising;

a plurality of fuel cell units each formed by stacking a plurality of fuel cells together, said fuel cells each comprising a plurality of power generation units arranged on a same plane, and electrically connected in series, said power generation units each including an anode, a cathode, and an electrolyte interposed between said anode and said cathode;

a power generation circuit for connecting said fuel cell units in parallel to a load; and

a switching mechanism for selectively connecting said fuel cell units to said power generation circuit.

6. A fuel cell system according to claim 5, further comprising:

a fuel gas supplying mechanism for supplying a fuel gas to said fuel cell units in parallel; and

an oxygen-containing gas supplying mechanism for

supplying an oxygen-containing gas to said fuel cell units in parallel,

wherein each of said fuel gas supplying mechanism and said oxygen-containing gas supplying mechanism have a valve for each of fuel cell units for stopping supply of said fuel gas and said oxygen-containing gas.

7. A fuel cell system according to claim 6, wherein first and second pumps are connected in parallel to said fuel gas supplying mechanism and said oxygen-containing gas supplying mechanism, and said first pumps supply predetermined amounts of said fuel gas and said oxygen-containing gas corresponding to a predetermined electrical energy supplied to said load and said second pumps supply small amounts of said oxygen-containing gas and said fuel gas corresponding to a small amount of electrical energy supplied to said load.

8. A fuel cell system according to claim 5, further comprising a coolant supplying mechanism for supplying a coolant to said fuel cell units in parallel,

wherein said coolant supplying mechanism has flow regulators for regulating a flow amount of said coolant supplied to each of said fuel cell units.

9. A fuel cell system according to claim 8, wherein a first pump and a second pump are connected in parallel to

said coolant supplying mechanism, and said first pump supplies a predetermined amount of said coolant corresponding to a predetermined electrical energy supplied to said load and said second pump supplies a small amount of said coolant corresponding to a small amount of electrical energy supplied to said load.

10. A fuel cell system according to claim 5, said fuel cell further including:

a pair of metal diffusion layers provided on both surfaces of said power generation units;

a resin insulator provided in said metal diffusion layer, between predetermined power generation units.

11. A fuel cell comprising a plurality of power generation units arranged on a same plane, said power generation units each including an anode, a cathode, and an electrolyte interposed between said anode and said cathode,

wherein said power generation units include at least a pair of adjacent power generation units each having at least one side adjacent to the other of power generation units;

said anode of one of said adjacent power generation units and said cathode of the other of said adjacent power generation units are provided on a same surface of said power generation units;

a pair of metal diffusion layers are provided on both surfaces of said power generation units; and

a resin insulator is provided in said metal diffusion layer, between predetermined power generation units.

12. A fuel cell according to claim 11, wherein a pair of electrically insulating separators are provided for sandwiching said metal diffusion layers and said power generation units interposed between said metal diffusion layers; and

at least one of said electrically insulating separators includes a fuel gas flow field and an oxygen-containing gas flow field provided alternately on one surface facing said power generation units, and a coolant flow field on the surface opposite to said surface facing said power generation units.

13. A method of operating a fuel cell unit formed by stacking a plurality of fuel cells together, said fuel cells each comprising a plurality of power generation units arranged on a same plane, and electrically connected in series, said power generation units each including an anode, a cathode, and an electrolyte interposed between said anode and said cathode, said method comprising the steps of:

connecting said fuel cells in parallel to a load and starting power generation for supplying electrical energy to said load; and

detecting power generation condition of said fuel cells, disconnecting a fuel cell in an abnormal condition

from said load and continuing power generation by the remaining fuel cells.

14. A method of operating a fuel cell unit according to claim 13, voltage level adjustment is performed in each of said fuel cells separately.

15. A method of operating a fuel cell system including a plurality of fuel cell units, said fuel cell unit each formed by stacking a plurality of fuel cells together, said fuel cells each comprising a plurality of power generation units arranged on a same plane, and electrically connected in series, said power generation units each including an anode, a cathode, and an electrolyte interposed between said anode and said cathode, said method comprising the steps of:

connecting said fuel cell units in parallel to a load and starting power generation for supplying electrical energy to said load; and;

detecting power generation condition of said fuel cell units, disconnecting a fuel cell unit in an abnormal condition from said load and continuing power generation by the remaining fuel cell units.

16. A method of operating a fuel cell system according to claim 15, wherein if said fuel cell system is operated for supplying a small amount of electrical energy to said load, which is smaller than an electrical energy supplied to

said load in a normal operating condition, power generation of at least one of said fuel cell units is stopped, and power generation of different fuel cells are stopped successively at predetermined time intervals.

17. A method of operating a fuel cell system according to claim 16, wherein an amount of coolant supplied to the fuel cell unit which has stopped power generation is smaller than an amount of coolant supplied to the fuel cell unit which is in operation for power generation.

18. A method of operating a fuel cell system according to claim 15, further comprising the steps of:

supplying predetermined amounts of a fuel gas, an oxygen-containing gas, and a coolant to said fuel cell units using first pumps corresponding to a predetermine amount of electrical energy supplied to said load; and

supplying small amounts of said fuel gas, said oxygen-containing gas, and said coolant to said fuel cell units using second pumps corresponding to a small amount of electrical energy supplied to said load.